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ON THE COMPOSITION OF THE WATER FROM A MINERAL  
SPRING IN THE VICINITY OF "THE GREAT SPIRIT  
SPRING," MITCHELL COUNTY, KANSAS.

By E. H. S. BAILEY and MARY A. RICE.

The analysis of the water of "The Great Spirit Spring" was published by G. E. Patrick in volume VII of the Transactions of the Kansas Academy of Science, and an analysis of the rock in the vicinity and of the scum deposited by the water was published in the Kansas University Quarterly, volume I, page 85. Through the kindness of a student of the university I have obtained a sample of water from a spring in the immediate vicinity of this celebrated spring, and have thought that the results of the analysis were of sufficient interest to warrant publication.

This spring is situated something over two miles east of Cawker City, and about one-half a mile southeast of the Great Spirit spring. It is surrounded on three sides by the bend of the river, and the water does not seem to come up through rock, but through the soil and deposited alluvium of the valley. There is another spring a short distance south of the spring under discussion, directly in the bed of the river, and at high water covered up by the river. Both these springs furnish an abundant supply of clear water.

Calculating the results in parts per 100,000 the composition of the water is as follows:

Silica and insoluble matter.....	1.53
Iron and aluminum oxides.....	1.66
Calcium oxide .....	38.66
Magnesium oxide .....	61.48
Sulfuric anhydride .....	269.50
Potassium oxide .....	21.20
Sodium oxide .....	753.30
Chlorin .....	740.00
Boric anhydride .....	a trace.
Carbonic anhydride (calculated) .....	35.69

For the sake of comparison, and in order to show the probable combination of the different constituents in the waters, below is given the result of the above analysis, calculated to grains per United States gallon of 231 cubic inches, and the analysis of the Great Spirit spring, calculated in the same manner, from the publication noted above:

	South spring.	Great Spirit spring.
Silica and insoluble matter.....	0.892	0.874
Iron and aluminum oxides .....	0.969	.....
Calcium carbonate .....	40.263	31.398
Magnesium carbonate .....	5.915	41.023
Magnesium sulfate .....	99.093	66.050
Sodium sulfate .....	143.065	206.357
Potassium sulfate .....	22.860	.....
Sodium chloride .....	711.147	775.703
Sodium biborate .....	a trace.	.....
Total solids .....	1,024.204	1,120.765

From an examination of these two analyses it can be readily seen that the waters are much alike, the Great Spirit spring being a little stronger than the other. This difference is noticed mostly in the sulfates and in the salt; yet, for all this, there is a remarkable similarity in the mineral salts and in their relative proportions.

A spring situated in the valley, where the water flowed off with little fall into the river, and where there was a frequent opportunity for erosion at high water, would not show the same tendency to build up a solid mound about it that a spring would that issued from the rocks on high ground. At any rate the analysis of this water may throw a little light on the method by which the mound of the Great Spirit spring was built up, as the two are in the same vicinity.